

REMARKS

A. Status of the Claims

Claims 1-70 were pending at the time of the last Office Action. Claims 36, 37, 52-60 and 67-70 have been withdrawn from consideration. Claim 31 has been canceled.

B. The New Drawings

New figures 26A and 26B are submitted to address the Office's objection set forth in paragraph 5 of the last Action.

New figure 22 is submitted to address the Office's objection in paragraph 6 of the last Action. The "B"s appearing in original figure 22 were, when the figure was created, originally squares. In converting the figure to something readable in Microsoft Word, the application must have converted the squares to character letters. New figure 22 depicts squares positioned in the same positions as the Bs; therefore, no new matter has been added.

C. Claim 13 Has Been Cancelled

Applicants do not agree with the Office's assessment that the subject matter of claim 13 has not been illustrated sufficiently to comply with Rule 83(a). Nevertheless, to expedite prosecution, Applicants have, without prejudice, cancelled claim 13.

D. Claim 31 Is Not a Duplicate of Claim 30

The Office objects to claim 31 under Rule 75 as being a substantial duplicate of claim 30. Applicants respectfully traverse. Both claims depend from claim 15. Claim 31 is directed to, in relevant part, a waveguide grating that includes a third layer that is in contact with the at least one **grating** layer. Claim 31 is not directed to, in relevant part, a waveguide grating that includes a third layer that is in contact with the at least one **waveguide** layer, as is claim 30. The two claims can cover the same structure – e.g., when the claimed at least one waveguide and at least

one grating layers are the same layer – but they do not necessarily cover the same structure. Therefore, they are not substantial duplicates, and the objection should be withdrawn.

E. Claims 61, 62, 65, and 66 Are Clear

The Office objects to claims 61, 62, 65, and 66 as reciting a phrase for which there is asserted to be insufficient antecedent basis: “one of the permittivities of the at least one permittivity.” The Office states that the objection can be obviated by deleting “one of the permittivities of” from the phrase.

There is sufficient antecedent basis for the phrase in question. Claims 61 and 62 both depend from claim 15. Claim 15 recites, among other things, a waveguide grating having at least one waveguide layer and a plurality of variable parameters “including at least one permittivity of the at least one grating layer.” Thus, the at least one grating layer of claim 15 has “at least one permittivity.” This means that the grating layer may have one permittivity, or multiple permittivities. The reference in claims 61 and 62 to one of these permittivities – i.e., to one of the one or more permittivities – has antecedent basis. No correction is required.

Claims 65 and 66 both depend from claim 35. Claim 35 recites, among other things, a waveguide grating having at least one waveguide layer and a plurality of variable parameters “including at least one permittivity of the at least one grating layer.” Thus, the at least one grating layer of claim 35 has “at least one permittivity.” This means that the grating layer may have one permittivity, or multiple permittivities. The reference in claims 65 and 66 to one of these permittivities – i.e., to one of the one or more permittivities – has antecedent basis. No correction is required.

F. Claims 1-12, 14, 38-40, 46 and 47 Are Patentable over Farah in view of Magnusson

The Office rejects claim 1-12, 14, 38-40, 46 and 47 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,891,747 to Farah (Farah) in view of U.S. Patent No. 5,598,300 to Magnusson et al. (Magnusson). Applicant respectfully traverses.

1. Claims 1-12 and 14 are Patentable over Farah in view of Magnusson

Claim 1 is directed to a waveguide grating device comprising a waveguide grating fabricated on the endface of at least one waveguide. The waveguide grating is composed of at least one waveguide layer and at least one grating layer.

Farah combined with Magnusson does not establish a *prima facie* case of obviousness with respect to claim 1. The Office asserts that it would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the same layer grating or the different layer grating of Magnusson with the device and method of Farah. Action at pages 5-6. The Office asserts that the gratings of Farah and Magnusson are considered equivalent structures known in the art, and one of ordinary skill in the art would have found it obvious to substitute one grating for another. The Office asserts that the motivation for the asserted combination would be the “significantly improved filter characteristics” that Magnusson offers. Action at page 6.

The Office’s assertions are not correct because the proposed combination would change the principle of operation of Farah. Though both Magnusson and Farah incorporate a grating, the purpose of the grating in each reference is not the same. Broadly, Farah is concerned with, in relevant part, passing along diffracted orders **other than** the zeroth order to an adjacent waveguide. By contrast, Magnusson is concerned with propagating **only** zeroth orders. To combine Magnusson’s teachings with those of Farah would render Farah useless.

Farah discloses, in relevant part, an extrinsic interferometric displacement sensor that produces phase modulation. Col. 3, lines 58-62. This is achieved by using a grating to change the direction of the light. Col. 3, lines 62-67; col. 8, lines 31-32. As shown in FIGS. 4A and 4B of Farah, the grating 31 yields many diffracted orders 33, 35, 38. Col. 8, lines 36-38. One of the orders not aligned with the waveguide axis 7 (i.e., orders 35 or 38) is picked up by the other fiber 5. Col. 8, lines 38-40. The zeroth order(s) (i.e., the order(s) not aligned with the axis of the waveguide) is not passed along. Therefore, the diffracted orders 35, 38 other than the zeroth order 33 are necessary for the light to couple from one fiber end 1' to the other fiber end 1'' across gap 4, a crucial function of Farah. Col. 5, lines 15-19.

Magnusson discloses an ideal or near ideal reflective filter having no or very low sidebands. Col. 2, lines 17-23. This is achieved by using a waveguide grating, which produces guided-mode resonance effects leading to low sidebands. Col. 2, lines 17-23. Therefore, the grating in Magnusson is designed "so that only the zero-orders propagate;" higher-order diffracted waves, also known as sidebands, are eliminated. Col. 4, lines 62-67.

To have the same layer grating in Magnusson with the device and method in Farah would change the principle of operation of Farah so as to make it virtually useless. Farah relies on a grating that allows higher-order diffracted waves to propagate. This is necessary for the light to couple from one fiber end to the other. In sharp contrast, the purpose of Magnusson is to eliminate the propagation of higher-order diffracted waves through a filter. If either the same layer or different layer grating in Magnusson was used with the device and method in Farah, the light would no longer couple from one fiber end to the other because only the zeroth-order diffracted wave would be transmitted. Thus, the relevant device in Farah would be virtually useless. "If the proposed modification or combination of the prior art would change the principle

of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” MPEP § 2143.01 at 2100-127 (citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)).

Accordingly, the obviousness rejection of claim 1 should be withdrawn and the claim should be issued. Claims 2-12 and 14 depend from claim 1, and are patentable over Farah in view of Magnusson for the same reasons as claim 1. Accordingly, the obviousness rejection of claims 2-12 and 14 should be withdrawn and those claims should also be issued.

2. Claims 38-40, 46 and 47 are Patentable over Farah in view of Magnusson

Claim 38 is directed to a method of forming a waveguide grating device comprising fabricating a waveguide grating on the endface of a waveguide to form the waveguide grating device. The term “waveguide grating” has been defined in the specification as having at least one waveguide layer and at least one grating layer. (Page 4, lines 22-23). This definition controls. MPEP § 2111.01 at 2100-47 (explaining that definitions provided in the specification should be followed when interpreting claims for the purpose of examination). The Office has admitted that Farah alone does not disclose such a grating. As recited above, Farah in view of Magnusson does not establish a *prima facie* case of obviousness because the asserted combination would change the principle of operation of Farah. Therefore, the claim is patentable over Farah in view of Magnusson. Accordingly, the obviousness rejection of claim 38 should be withdrawn and the claim should be issued.

Claims 39-40, 46 and 47 depend from claim 38, and are patentable for the same reasons. Accordingly, the obviousness rejection of claims 39-40, 46 and 47 should be withdrawn and those claims issued.

G. Claim 13 Is Patentable over Farah in view of Magnusson and Carter

The Office rejects claim 13 under 35 U.S.C. §103(a) as being obvious over Farah in view of Magnusson and in further view of U.S. Patent No. 4,531,809 to Carter et al. (Carter). Applicant respectfully traverses.

Claim 13 depends from claim 12 above. The Office, relying on the combination of Farah in view of Magnusson, asserts that Carter teaches an organic layer. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Carter does not cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 13 should be withdrawn and the claim should be issued.

H. Claims 15-19, 22-32, 34-35 and 61-66 Are Patentable over the Asserted Combination

The Office rejects claims 15-19, 22-32, 34-35 and 61-66 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson and U.S. Patent No. 6,191,890 to Baets et al. (Baets). Applicant respectfully traverses.

1. Claims 15-19, 22-32, 34 and 61-62 are Patentable over the Asserted Combination

Claim 15 is directed to a system for spectral filtering that utilizes a guided-mode resonance effect in a waveguide. The system comprises a waveguide grating device that includes at least one waveguide and a waveguide grating fabricated on the endface of the at least one waveguide. The waveguide grating comprises at least one waveguide layer and at least one grating layer.

The Office, relying on the combination of Farah in view of Magnusson, asserts that Baets teaches grating fill factor as a variable parameter and Magnusson further teaches a grating period less than the wavelength of the signal. Even accepting this is as true for the sake of argument,

Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Baets does not cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 15 should be withdrawn and the claim should be issued.

Claims 16-19, 22-32, 34 and 61-62 depend from claim 15, and are patentable for the same reasons. Accordingly, the obviousness rejection of claims 16-19, 22-32, 34 and 61-62 should be withdrawn and those claims issued.

2. Claims 35 and 61-66 are Patentable over the Asserted Combination

Claim 35 is directed to a waveguide grating device comprising a waveguide grating fabricated on the endface of at least one waveguide, where the waveguide grating includes at least one waveguide layer and at least one grating layer.

The Office, relying on the combination of Farah in view of Magnusson, asserts that Baets teaches grating fill factor as a variable parameter and Magnusson further teaches a grating period less than the wavelength of the signal. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Baets does not cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 35 should be withdrawn and the claim should be issued.

Claims 63-66 depend from claim 35, and are patentable for the same reasons. Accordingly, the obviousness rejection of claims 63-66 should be withdrawn and those claims issued.

I. Claim 20 Is Patentable over the Asserted Combination

The Office rejects claim 20 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson, Baets and U.S. Patent No. 4,753,529 to Layton (Layton). Applicant respectfully traverses.

Claim 20 depends from claim 19 above. The Office, relying on the combination of Farah in view of Magnusson and Baets, asserts that Layton teaches a detector comprising silicon. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Neither Baets nor Layton cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 20 should be withdrawn and the claim should be issued.

J. Claim 21 Is Patentable over the Asserted Combination

The Office rejects claim 21 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson, Baets and U.S. Patent No. 4,533,247 to Epworth (Epworth). Applicant respectfully traverses.

Claim 21 depends from claim 19 above. The Office, relying on the combination of Farah in view of Magnusson and Baets, asserts that Epworth teaches a detector comprising a human eye. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Neither Baets nor Epworth cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 21 should be withdrawn and the claim should be issued.

K. Claim 33 Is Patentable over the Asserted Combination

The Office rejects claim 33 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson, Baets and U.S. Patent No. 5,442,169 to Kunz (Kunz). Applicant respectfully traverses.

Claim 33 depends from claim 32 above. The Office, relying on the combination of Farah in view of Magnusson and Baets, asserts that Kunz teaches a detector comprising an electrochemical sensor. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Neither Baets nor Kunz cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 33 should be withdrawn and the claim should be issued.

L. Claim 41 Is Patentable over the Asserted Combination

The Office rejects claim 41 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson and U.S. Patent No. 5,863,449 to Grabbe (Grabbe). Applicant respectfully traverses.

Claim 41 depends from claim 40 above. The Office, relying on the combination of Farah in view of Magnusson, asserts that Grabbe teaches dipping. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Grabbe does not cure this deficiency. Therefore, the claim is patentable over the asserted combination. Accordingly, the obviousness rejection of claim 41 should be withdrawn and the claim should be issued.

M. Claims 42-44 Are Patentable over the Asserted Combination

The Office rejects claims 42-44 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson, Grabbe and International Publication No. WO 97/47997 to Hobbs (Hobbs). Applicant respectfully traverses.

Claims 42-44 depend from claim 41 above. The Office, relying on the combination of Farah in view of Magnusson and Grabbe, asserts that Hobbs teaches holographic interferometry or photolithography patterning. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Neither Grabbe nor Hobbs cure this deficiency. Therefore, the claims are patentable over the asserted combination. Accordingly, the obviousness rejection of claims 42-44 should be withdrawn and those claims issued.

N. Claims 45 and 48 Are Patentable over the Asserted Combination

The Office rejects claims 45 and 48 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson and U.S. Patent No. 5,291,574 to Levenson et al. (Levenson). Applicant respectfully traverses.

Claims 45 and 48 depend from claims 40 and 38 above. The Office, relying on the combination of Farah in view of Magnusson, asserts that Levenson teaches spin coating or sputtering. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Levenson does not cure this deficiency. Therefore, the claims are patentable over the asserted combination. Accordingly, the obviousness rejection of claims 45 and 48 should be withdrawn and those claims issued.

O. Claims 49-51 Are Patentable over the Asserted Combination

The Office rejects claims 49-51 under 35 U.S.C. § 103(a) as being obvious over Farah in view of Magnusson and U.S. Patent No. 6,096,127 to Dimos et al. (Dimos). Applicant respectfully traverses.

Claims 49-51 depend from claim 38 above. The Office, relying on the combination of Farah in view of Magnusson, asserts that Dimos teaches thermal evaporation, electron-beam evaporation, or liquid phase epitaxy. Even accepting this is as true for the sake of argument, Farah in view of Magnusson fails to establish a *prima facie* case of obviousness as recited above. Dimos does not cure this deficiency. Therefore, the claims are patentable over the asserted combination. Accordingly, the obviousness rejection of claims 49-51 should be withdrawn and those claims issued.

P. Petition for Extension of Time

Pursuant to 37 C.F.R. § 1.136(a), Applicant petitions for an extension of time of two months up to and including August 12, 2003 in which to respond to the Office Action dated March 12, 2003. Pursuant to 37 C.F.R. § 1.16 and 1.17, a check in the amount of \$205 is enclosed, which is the process fee for a two-month extension of time. If the check is inadvertently omitted, or should any additional fees under 37 C.F.R. §§ 1.16 to 1.21 be required for any reason relating to the enclosed materials, or should an overpayment be included, the Office is authorized to deduct or credit the appropriate fees from or to Fulbright & Jaworski Deposit Account No.: 50-1212/UTSL:058US/MTG.

Q. Conclusion

Applicant respectfully submits that claims 1-35, 38-51 and 61-66 are in condition for allowance. Should the examiner have any questions, comments, or suggestions relating to this application, he is invited to contact the undersigned attorney at (512) 536-3031.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark T. Garrett", written in a cursive style.

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